

Earth's Materials and Changes

3-3 The student will demonstrate an understanding of Earth's composition and the changes that occur to the features of Earth's surface. (Earth Science)

3.3.8 Illustrate changes in Earth's surface that are due to slow processes (including weathering, erosion, and deposition) and changes that are due to rapid processes (including landslides, volcanic eruptions, floods, and earthquakes).

Taxonomy level: 2.2-B Understand Conceptual Knowledge

Previous/Future knowledge: In 1st grade (1-4.4), students recognized that water flows downhill. This concept can be used as background for understanding weathering and erosion. All the other concepts are new to 3rd grade but can be tied to other indicators such as 3-3.1, 3-3.5, and 3-3.6. Students will further develop this concept in 5th grade (5-3.1) to include how these natural processes affect the land and oceans in constructive and destructive ways.

It is essential for students to know that the surface of Earth does change in natural ways. Sometimes the change can be caused by a very slow process and at other times it can be caused by a rapid process. There is often evidence on the surface that these processes have caused a change.

Changes Due to Slow Processes

Weathering

When weathering is occurring, Earth materials, for example rocks are being broken apart. Little or big cracks in the rock are evidence that weathering is taking place.

Erosion

When erosion is occurring, Earth materials, like rock, sand, and soil, are being carried away from their original location. Water and wind are often the causes for erosion.

Deposition

When deposition is occurring, Earth materials that have been eroded are put in a new location. When the wind stops blowing, sand and soil may be put down in piles as large as dunes. Water may deposit its material at the end of a river and form a delta.

Changes Due to Rapid Processes

Landslides

When a landslide is occurring, Earth materials, like rock, sand, and soil, on the side of a slope or cliff drop down to a lower location. Water soaking into the ground often makes this happen.

Volcanic Eruptions

When a volcanic eruption is occurring, Earth material called *lava* comes out of the volcano flows down the side of the volcanic mountain (or is sent up into the air and lands nearby) where it hardens. The hardened volcanic rock forms new Earth material and often makes the volcanic mountain larger.

Floods

When a flood is occurring, a lot of water causes rivers and streams to overflow their banks over the surrounding land around them. Heavy rainfall in the area is usually the cause of a flood.

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Earthquakes

When an earthquake is occurring, the surface of the ground shakes and rolls causing damage to the Earth's surface, like cracks and other openings, and damage to roads and buildings.

It is not essential for students to know runoff across Earth's surface as part of the water cycle. They do not need the geology of why a landslide, a volcanic eruption, or earthquake occurs.

Assessment Guidelines:

The objective of this indicator is to *illustrate* natural changes to Earth's surface; therefore, the primary focus of assessment should be to give illustrations of these concepts or use illustrations to show understanding of changes that occurs because of identified slow and rapid processes. However, appropriate assessments should also require students to *interpret* a before and after picture to identify an event or describe the change; or *compare* the slow and rapid processes as to end result, amount of damage, or effect on manmade structures.